

ABSTRACT OF THE DISCLOSURE

A fine carbon fiber having an outer diameter of about 1 to about 80 nm and an aspect ratio of 10 to 30,000, comprising a hollow center portion and a multi-layer sheath structure of a plurality of carbon layers, the layers forming annual rings, wherein the sheath-forming carbon layers form an incomplete sheath, i.e., the carbon layers are partially broken or disrupted in a longitudinal direction, and the outer diameter of the carbon fiber and/or the diameter of the hollow center portion are not uniform in a longitudinal direction. The carbon fiber is obtained by instantaneously reacting a carrier gas at a high temperature and an organic compound gas kept at a temperature below the decomposition temperature of the transition metal compound and has a conductivity equivalent to that of a conventional vapor phase method and is useful as a filler material in resins, rubbers, paints and the like.